

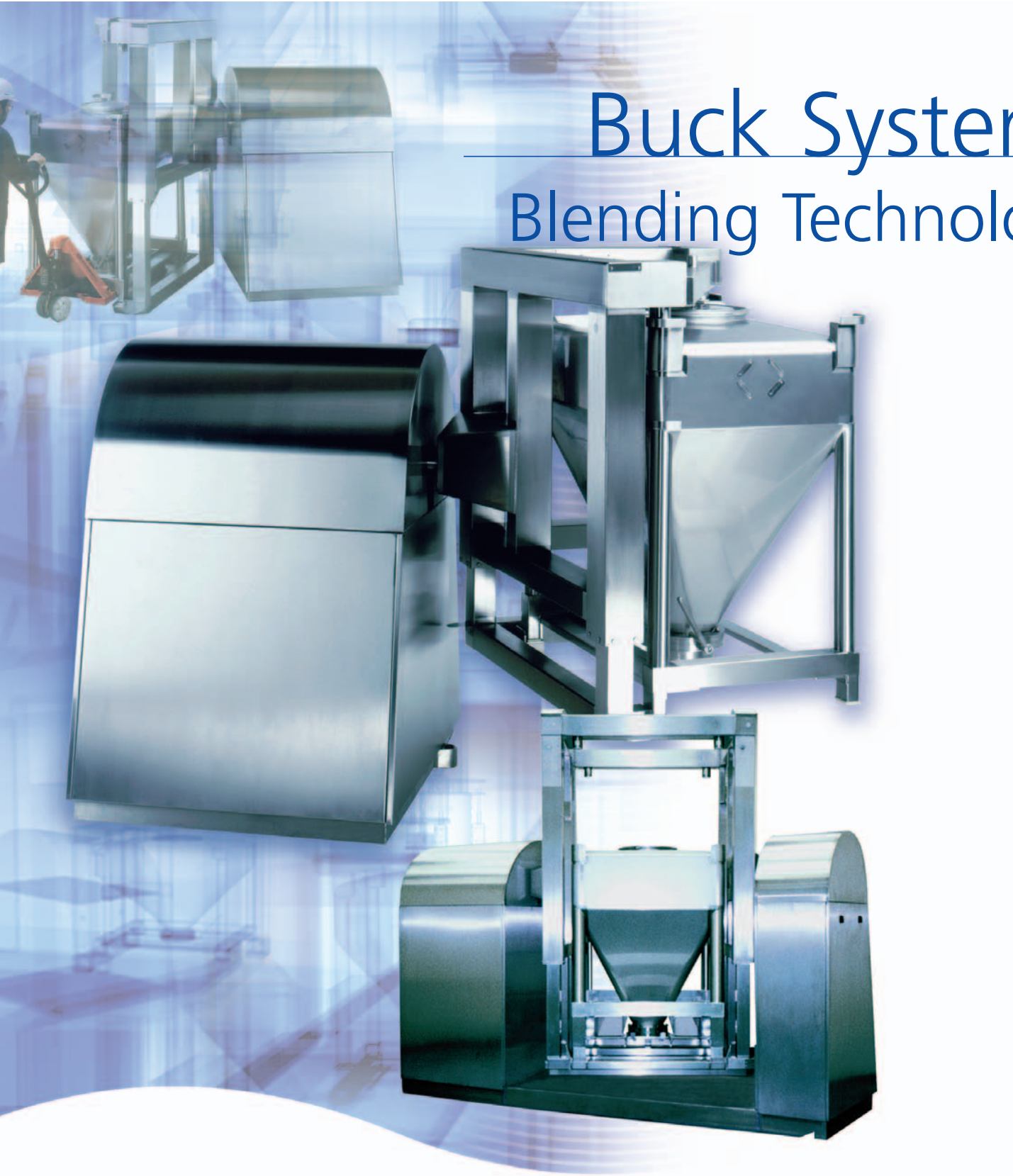


Process Engineering
Division

Niro Pharma Systems

AEROMATIC
BUCK
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NIRO

Buck Systems Blending Technology



IBC Blending

Container blending has long been established as the most efficient method of blending granules and powders in the pharmaceutical manufacturing process. Reduced loading and unloading times, reduced cleaning time of both machinery and room, improved containment and batch integrity have established IBC blending as the pharmaceutical industry's technology of choice.

The Buck "Pedestal" blender range allows blending in all volumes of IBC up to 3000L capacity.

Efficient Blending Process

Buck Systems have spent years researching and understanding the science of IBC Blending. Homogenous product blending is ensured through scientific design of the blending cage and the container geometry.

The unique Prism™ technology is proven to improve blending times. The additional shear that the Prism™ provides to the mixing process allows even cohesive poor flowing materials to be blended within the IBC.

Long Working Life

A robust mechanical construction ensures a long working life for the Buck Blender.

The clamping cage securely clamps at both the top and the bottom of the IBC, which means that no stress from the rotation is exerted on the IBC, preventing premature damage of the IBCs.

Safety First

Air driven screw jacks ensure that the IBC remains clamped in the cage, even when utilities to the machine are lost. Positive IBC detection prevents blender operation unless the IBC is fully clamped. The cage rotation motor is a braked motor, preventing any movement of the cage if utilities are lost, and allowing for Emergency stop of the rotating cage.

Controls

The control system is simple and user friendly, with blend recipes easily loaded and completed batch information printed in an easy to read format. CFR 21 Part 11 compliant controls are available for electronic records and batch information. Blending speed is controlled through a variable speed drive. The control system is available in either Siemens or Allen Bradley versions.

Through the Wall Design

The Blender can be designed for installation with the main pedestal housed in a technical area and the clamping cage in the process area. An airtight wall plate is supplied as a barrier between the two rooms. The advantage of this installation is the processing room can be reduced in size thereby reducing room cost and running cost. Technicians can access the pedestal from the technical side, without needing to go through the GMP production area.

Swinging Arms

The Swinging Arms feature allows a wider range of IBC volumes to be handled within the same blender. When a smaller IBC is loaded into the blender, the spacer arms are swung out into the path of the IBC, bridging the height difference of the smaller IBC. The spacer arms maintain the smaller IBCs position at the centre of the rotation axis, and reduce the clamping time.

Post Hoist Blending

The Buck Systems blender range is extended further with our range of Post Hoist Blenders. All of the features and benefits of the Pedestal Blenders are repeated with the Post Hoist range. But the added benefits of elevating the IBC after blending allowing for direct discharge into a downstream process, such as a IBC to IBC Milling amongst others. For more information on Buck Systems' Post Hoists and Post Hoist Blenders, please refer to the Post Hoist data sheet.

Lab Scale Blending

A Lab Scale Blender for 3-30L volume blending is available, allowing easy and repeatable scale up to the production scale blenders. The Lab Blender is available both for purchase and for rental. For more information on Buck Systems' Lab Blenders, please refer to the Lab Blender data sheet.

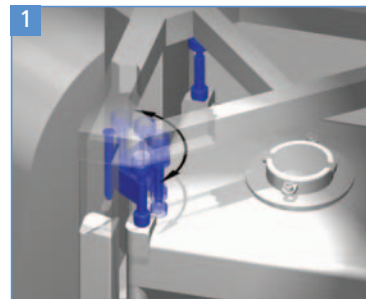
Prism™ Mixing

The Prism™ has been developed to aid and improve blending of powdered and granular materials. The Prism™ adds low shear mixing to the rotating IBC, adding to the turbulence of the tumbling product and improving the time to homogeneously blend products.

When the IBC is loaded into the blender, the Prism™ is orientated at right angles to the rotation axis. As the IBC is rotated, the product is divided up by the Prism™, and product is forced outwards to the corners of the IBC.

The Prism™ is of particular benefit to dry blend processes, where IBC Blending is the key process step. For Dry Blending, or Direct Compression products, the powders are more cohesive and have poorer flow properties. Dry powders take noticeably longer to blend in comparison to free flowing granular materials (for example the dispersion of magnesium stearate into a granulated batch) which blend easily and within a relatively short period of time.

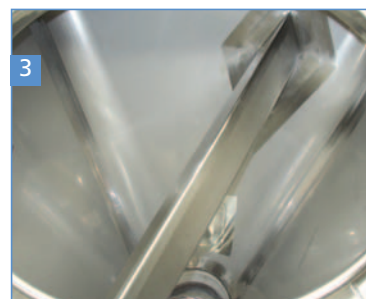
The Prism™ is fully welded into the container body, and can be fully cleaned in place with the Buck Systems' Wash Station.



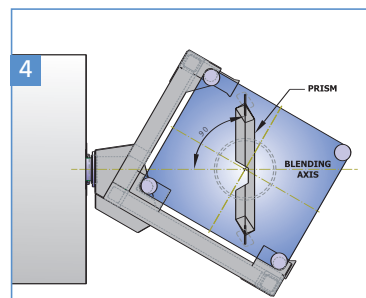
Swinging arms



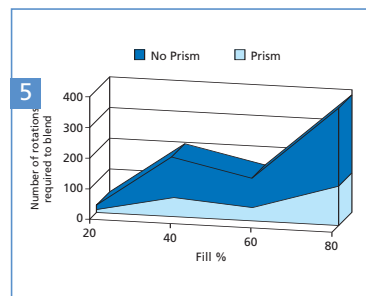
Lab Scale blender



Blender Prism™ integral to the IBC construction



Prism™ mixing



Blending with Prism™ / without Prism™

TECHNICAL DETAILS

| | |
|-------------------------|--|
| Blend Geometry | Rectangular IBC, off-set by 30° |
| Speed Range | 2 – 15 RPM ± 0.5 |
| Blend Parameters | Time and Speed |
| End Point Determination | Duration of Cycle Time, Optional NIR. |
| Clamping Mechanism | IBC securely clamped top and bottom in the clamping cage. Two screw jacks lift the bottom section of the cage, while a pneumatic pressure switch detects the clamped IBC, providing failsafe clamping. |
| Container Loading | Container is easily loaded into the clamping cage using a low lift pallet truck |
| Blending Drive | Inverter controlled variable speed motor drive |

DIMENSIONS, WEIGHTS & VOLUMES

| Model | SP1000 | SP1500 | SP2000 | DP2500 | DP3000 |
|-----------------------------------|--------------------|---|-------------|---|-------------|
| Pedestals | One Drive Pedestal | | | One Drive Pedestal and one support Pedestal | |
| IBC Size | Size 4 | Size 4 | Size 4 | Size 5 | Size 5 |
| IBC Footprint | 1125mm x 1325mm | | | 1350mm x 1590mm | |
| Dimensions | Figure 1 | | | Figure 2 | |
| Dimension A | 3330mm | 3330mm | 3564mm | 4835mm | 4835mm |
| Dimension B | 2711mm | 3184mm | 3386mm | 4026mm | 4026mm |
| Dimension C | 2756mm | 3252mm </td <td>3443mm</td> <td>4130mm</td> <td>4130mm</td> | 3443mm | 4130mm | 4130mm |
| Dimension D | 500mm | 500mm | 500mm | 500mm | 500mm |
| IBC Range (without Swinging Arms) | 700L-1000L | 900L-1500L | 1600L-2000L | 2500L | 3000L |
| IBC Range (with Swinging Arms) | – | 700L-1500L | 700L-2000L | 1250L-2500L | 1250L-3000L |
| Maximum working load* | 900kg | 1250kg | 1600kg | 2000kg | 2500kg |
| Drive Motor | 4.0 Kw | 5.5 Kw | 7.5 Kw | 11 Kw | 15 Kw |

* Maximum load calculations are based on weight of the IBC plus a worst case bulk density of 0.8 Kg/L and a 80% product fill ratio.

** Smaller IBCs can be blended by adopting a 'Bottle in Frame' design for the smaller IBC.

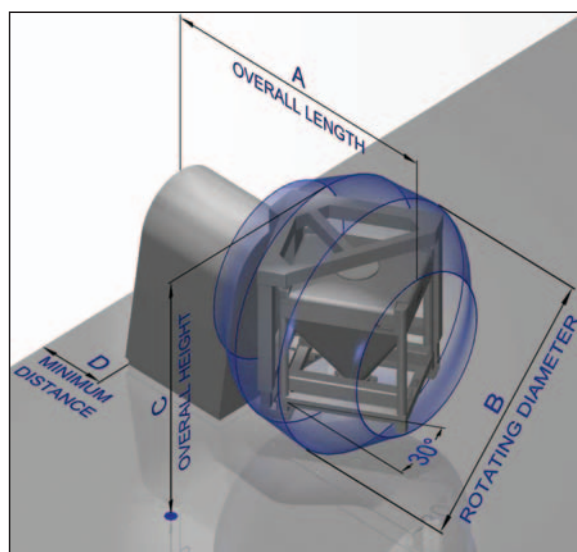


Figure 1

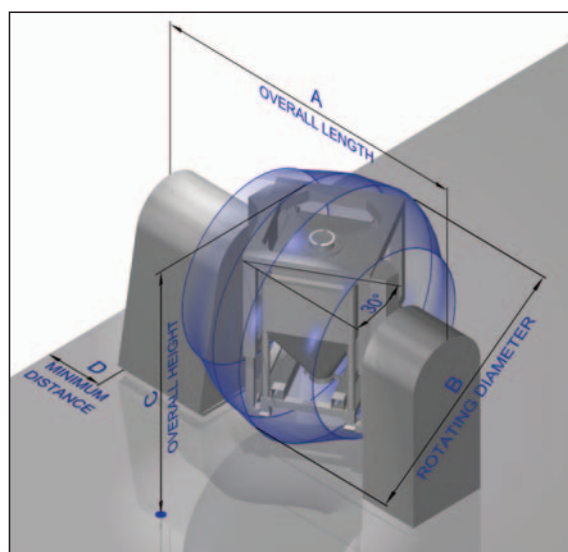


Figure 2

MATERIAL OF CONSTRUCTION AND FINISHES

| | |
|--------------------------|---|
| Clamping Cage | BS EN 10088-2 1.4301 (AISI 304) stainless steel 0.5 - 1.0 μm Ra, with welds left as laid. |
| Pedestal | |
| Pedestal Covers | |
| Switchgear control panel | Painted Mild Steel Panel RAL 7032 |
| Operator Panel | BS EN 10088-2 1.4301 (AISI 304) stainless steel 0.5 - 1.0 μm Ra |

CONTROL SYSTEM

Siemens

S7-300 Series PLC

TP170B Colour Touch Screen

Micromaster 6SE-420/440 Inverter

Allen Bradley

Micrologix 1200 PLC

PanelView 600

FlexPower 70 Inverter

Main Switch Gear Control Cabinet

Painted mild steel for location within a technical area

IP55 rating

Suitable for Safe Area operation

1200mm x 500mm by 1800mm high + 100mm plinth

Houses the PLC (see above), AC Inverter (see above), Braking Unit, Hardwired Safety System

Operator Control Panel

Stainless Steel flush wall mounted

IP65 rating

Suitable for Safe Area operation

380mm x 600mm by 210mm deep + 100mm Plinth

Houses the HMI (see above), Controls On button, Fortress Interlock Key, Dot Matrix Printer and Emergency Stop

FEATURES AND BENEFITS CHECKLIST!

- Reduced Loading and Unloading Times
- No Product Clean-downs
- Contained Blending
- Efficient blending through off-set blending angle and IBC geometry
- Prism™ Blending Technology
- GMP Design
- Fully enclosed pedestal and drive
- Robust Mechanical Construction
- Stress Free IBC Clamping
- Failsafe Clamping System
- Positive IBC Detection
- Fortress Key Interlock
- Light Beam safety curtain
- No hydraulics
- Pallet Truck Loading
- Through the Wall design
- Swinging Arms for multiple IBCs heights
- Variable Speed Drive
- Standard
- Optional
- User Friendly Control System
- Siemens PLC and HMI
- Allen Bradley PLC and HMI
- ATEX compliance
- CFR 21 Part 11 compliant
- Blend recipe storage
- User access functionality
- Validation Documentation in accordance to GAMP
- NIR Analysis

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Niro Pharma Systems unites the technologies of Aeromatic, Buck, Collette, Courtoy, Fielder, Nica and Niro to supply advanced processing solutions for solid dosage forms to the pharmaceutical industry.

Buck Systems

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